INSTALLATION/OPERATION

PT270P
Light Duty Pan/Tilt

C323M-I (6/04)

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1.0 General

1.1 IMPORTANT SAFEGUARDS AND WARNINGS

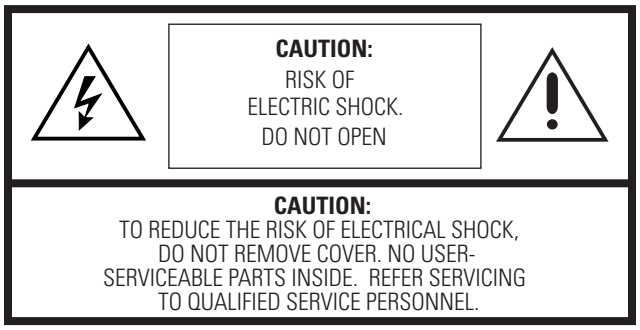
Prior to installation and use of this product, the following WARNINGS should be observed.

1. Installation and servicing should only be done by qualified service personnel and conform to all local codes.
2. Unless the unit is specifically marked as a NEMA Type 3, 3R, 3S, 4, 4X, 6, or 6P enclosure, it is designed for indoor use only and it must not be installed where exposed to rain and moisture.
3. The weight of the camera, lens, and enclosure shall not exceed 15 lb (6.81kg).
4. Only use replacement parts recommended by Pelco.
5. After replacement/repair of this unit's electrical components, conduct a resistance measurement between line and exposed parts to verify the exposed parts have not been connected to line circuitry.
6. The installation method and materials should be capable of supporting four times the weight of the enclosure, pan/tilt, camera and lens combination.
7. To satisfy CE compliance regulations, European users must provide a suitable earth ground connection to PT270 Series Pan/Tillts..

The product and/or manual may bear the following marks:

This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



Please thoroughly familiarize yourself with the information in this manual prior to installation and operation.

2.0 Description

Pan/tilts in the PT270 Series are engineered to accommodate lightweight CCTV cameras and are capable of handling enclosure, camera and lens combinations weighing up to 15 pounds (6.8 kg). Small in size, but rugged in operation, pan/tilts in the PT270 Series are ideal for applications where space is at a minimum.

Constructed of aluminum and steel, the pan/tilts feature long-life 24 VAC, 120 VAC or 230 VAC motors that are capable of continuous auto scan.

2.1 MODELS

PT270P	Light duty “mini” pan/tilt, 120 VAC
PT270-24P	Light duty “mini” pan/tilt, 24 VAC
PT270P/230	Light duty “mini” pan/tilt, 230 VAC

3.0 Installation

Pan/tilts in the PT270 Series are designed to mount onto a horizontal surface in the upright or inverted position.

In order to ensure proper wiring and system operation of all components, it is highly recommended that the pan/tilt and the associated control equipment is tested in your facility before field installation. Refer to Sections 3.2 and 3.3.

3.1 MOUNTING

Attach the pan/tilt unit to a mount, following the instructions that accompany the mount. To ensure maximum pan travel, mount the pan/tilt so that the fixed limit stop is directly opposite the center of the intended viewing area.

Make sure the mounting surface and the mounting method is strong enough to support four times the combined weight of the pan/tilt, enclosure, camera and lens. The camera and lens must be correctly mounted and balanced on the tilt table for proper operation.

3.1.1 CONNECTING TO AN EARTH GROUND, CE COMPLIANCE

To ensure a proper earth-ground connection to your pan/tilt, a braided wire strap (not provided) described below must be in direct contact with the bare metal around the middle mounting hole on the underside of the base.

1. Establish the nearest earth ground.
2. Using 1-inch wide (2.54 cm) copper or aluminum braided wire, cut a length that will reach from the base of the pan/tilt to the earth ground. Make a hole in the braided wire, 1-inch from one end, so that a pan/tilt mounting bolt is able to go through the opening.
3. Mount the pan/tilt with the braided wire strap in direct contact with the bare metal around the middle mounting hole. See A, Figure 1.
4. After mounting the pan/tilt, attach the strap to your earth ground in a suitable manner.

⚠ **CAUTION:** Pan/tilts in the PT270 Series are indoor units and should not be used outdoors. The units are designed for upright or inverted operation and should never be mounted horizontally.

IMPORTANT: In order to satisfy CE immunity requirements and eliminate failures caused by electrostatic discharge, European users must connect PT270P Series pan/tilts to an earth ground.

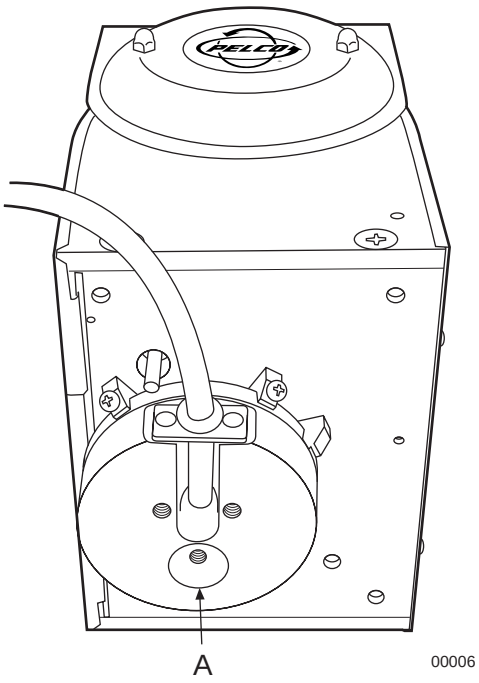


Figure 1. Earth Ground Connection

3.2 WIRING

⚠ CAUTION:

- The PT270-24P Pan/Tilt is designed to operate at 24 volts AC.
- Input voltage must not exceed 28 volts or drop below 22 volts or else damage will occur.

Cable distances should not exceed the distances specified in Table A. Cable fabrication must be in accordance with Section 3.2.1, Mating Connector Assembly. The following are some recommended common installation practices.

1. Always use jacketed stranded multi-conductor interconnecting cable between the control and the pan/tilt unit, with additional conductors than needed for future servicing and or additions.
2. Always use color-coded conductors for ease of wiring and to identify functions at a later date.
3. Keep a wiring diagram with the system for later use and reference.

Table A. Maximum Cable Distances

Maximum Distance		
Wire Size	**PT270-24P** (24 VAC, 60 Hz)	
	6 Conductors	7 Conductors*
20 Awg 18 Awg 16 Awg	159 ft (48.46 m) 254 ft (77.42 m) 403 ft (122.83 m)	274 ft (83.51 m) 437 ft (133.19 m) 694 ft (211.53 m)
	PT270P (120 VAC, 60 Hz)	**PT270P/230** (230 VAC, 50 Hz)
Wire Size	6 Conductors	7 Conductors*
20 Awg 18 Awg 16 Awg	4,547 ft (1,385.9 m) 7,234 ft (2,204.9 m) 11,481 ft (3,499.4 m)	14,714 ft (4,484 m) 23,409 ft (7,135 m) 37,151 ft (11,323 m)

*Using 2-wire motor common

Cable distances are for both motors running and assuming a 10% voltage drop in the cable.

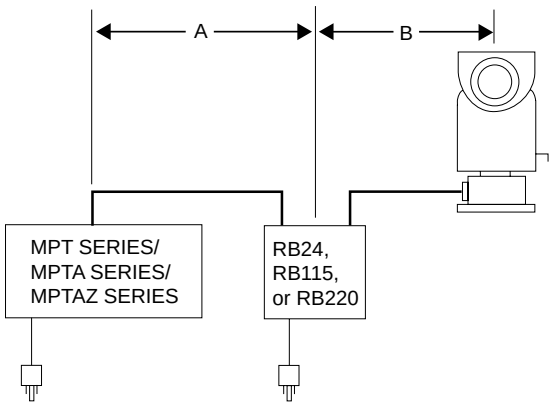
Six-conductor cable, single common conductor is recommended. Distances are approximate maximum recommended under the following conditions:

- Simultaneous pan/tilt activation
- Minimum at pan/tilt:
  - 21.6 volts (PT270-24P)
  - 103.5 volts (PT270P)
  - 198.0 volts (PT270P/230)

Operating distance may be extended by using an appropriate remote relay box: RB24 (24VAC pan/tilt), RB115 (120 VAC pan/tilt), or RB220 (230 VAC pan/tilt). Refer to Table B for extended cable distances.

Table B. Recommended Cable Distances Using RB24, RB115, or RB220 Relay Box

Wire Size (Awg)	Maximum Distance "A"	Maximum Distance "B"
		RB24
20 18 16	5,800 ft (1,768 m) 8,250 ft (2,515 m) 13,000 ft (3,962 m)	159 ft (48.46 m) 254 ft (77.42 m) 403 ft (122.83 m)
		RB115
20 18 16	5,800 ft (1,768 m) 8,250 ft (2,515 m) 13,000 ft (3,962 m)	4,547 ft (1,385.9 m) 7,234 ft (2,204.9 m) 11,481 ft (3,499.4 m)
		RB220
20 18 16	5,800 ft (1,768 m) 8,250 ft (2,515 m) 13,000 ft (3,962 m)	14,714 ft (4,484 m) 23,409 ft (7,135 m) 37,151 ft (11,323 m)



3.2.1 MATING CONNECTOR ASSEMBLY

To assemble the mating connector, refer to Figure 2 and perform the following steps.

1. Slide the connector clamp assembly over the conductor cable. If the diameter of the conductor cable is such that the rubber boot will slide over it easily, slide the rubber boot onto the conductor cable at this time. If not, discard the rubber boot.
2. Refer to Detail A in Figure 2. Prepare the wires from the conductor cable as follows:
   a. Strip at least 1-inch (2.54 cm) from the cable jacket to expose the wires. You may need to strip more from the cable jacket if you have more wires.
   b. Strip 1/8-inch (0.125 cm) from each wire.
   c. Using an AMP style crimper, crimp the wires and their insulation to the connector pins.
3. Slide the connector pins into the appropriate holes in the connector body until they snap into place. Refer to detail B in Figure 2 and to Figure 3 for correct pin arrangement.
4. Push the connector clamp assembly (with boot, if used) toward the connector body. Screw the clamp assembly onto the connector body, being careful not to disturb the wires.
5. To complete the assembly, attach the appropriate clamp with the screws provided and tighten.

NOTES:

- Contacts cannot be removed from the connector without the use of the appropriate AMP extraction tool (ZT305183), which is available from Pelco.
- When a pan/tilt is mounted in the inverted position, the LEFT/RIGHT and UP/DOWN functions are reversed during operation. To correct this problem, reverse the LEFT/RIGHT functions in the control cable (pins 3 and 7) at the pan/tilt or control and the UP/DOWN functions (pins 5 and 6) at the pan/tilt or control

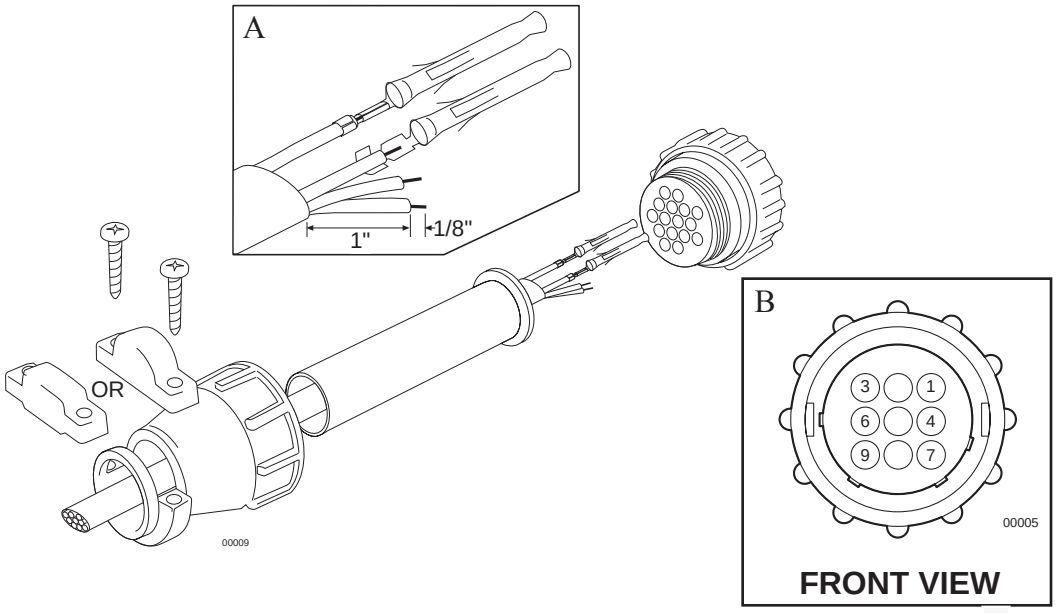


Figure 2. Mating Connector Assembly Diagram

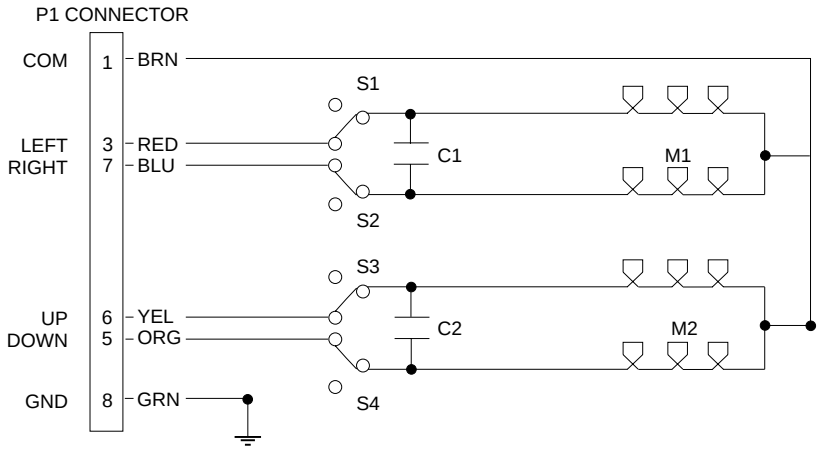


Figure 3. PT270 Series Wiring Diagram

3.3 LIMIT STOP ADJUSTMENTS

⚠ WARNING:

- **Do not operate pan/tilt without limit stops**. Do not attempt to adjust the limit stops while the unit is operating. Personal injury or damage to the unit may result.
- **Do not** remove or reposition the fixed limit stop on the pan/tilt. **DAMAGE WILL OCCUR.**

To set pan/tilt limit stops, perform the following steps. Refer to Figure 4.

1. Loosen the pan limit stops.
2. Turn the control unit on. Pan the unit to the right until the desired right pan limit is reached.
3. Move the right pan limit stop until it touches the pan limit switch actuator. Move the stop a slight distance further against the actuator until it clicks to indicate the opening of the limit switch. Lock the stop in place.
4. Pan the unit to the desired left position. Adjust the left pan limit stop as described in step 3.
5. Pan left and right to both limit stops and check for exact positioning. Tighten both stops securely.
6. Remove the cover plate from the left side of the tilt table. Loosen the limit stop screws and tilt the table, using the joystick, to the desired up position.
7. Move the up limit stop until it touches the tilt limit switch actuator and clicks. Lock the stop in place.
8. Tilt the table to the desired down position and set the stop in the same manner.
9. Tilt the table up and down and check for exact positioning. Tighten both stops securely. Replace the cover plate.

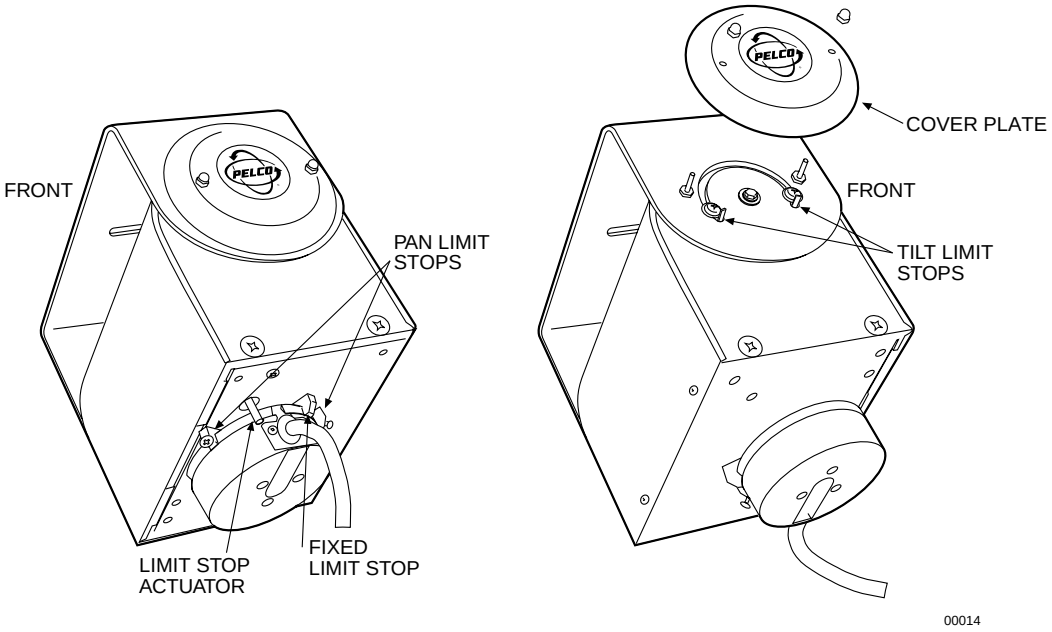


Figure 4. Limit Stops

4.0 Operation

Refer to the manual for your control equipment for operating the pan/tilt unit.

The pan/tilts of the PT270 Series will function in an Auto/Random scan operation when used with the appropriate Pelco control system. The pan/tilt has no additional limit switches or relays for continuous auto scan operation and is, therefore, only compatible with current sensing auto/random type circuits used in the controller.

5.0 Troubleshooting

Some common problems encountered with pan/tilt systems include miswiring, overloading, and not using the units for the correct application.

If the pan/tilt unit fails to operate, do the following:

1. Check the fuse in the control unit. If the fuse is bad, replace it.
2. If the fuse blows after replacing it, check the control cable between the control unit and the pan/tilt for shorts, high resistance, or opens.
3. If the control cable is good, reconnect it to the control unit but not to the pan/tilt. Replace the fuse and operate the control unit. If the fuse blows again, the fault is in the control.

Refer to Figure 3 for the following steps.

4. If the control unit is good, check the wiring harness in the pan/tilt for shorts.
5. If the wiring harness is good, check the motor starting capacitors.
6. If the starting capacitors are good, check the motors for opens and shorts. There should be low resistance between the windings.
7. Check the limit switches for opens and shorts.

5.1 SERVICE MANUAL

If you need to service your unit, obtain a service manual in one of the following ways:

- Go to Pelco's web site at http://www.pelco.com and find service manual C323SM.
- Contact Pelco's Literature Department and request service manual C323SM.

6.0 Maintenance

Inspect the pan/tilt unit every six months to ensure trouble-free operation and an extended product life. Harsh environments and/or continuous motion applications may require more frequent maintenance.

REMINDER: The warranty on any pan/tilt operated in continuous motion applications (that is, preset scan, tour, and auto scan modes) is six months after date of shipment.

Please read all of the instructions that follow before servicing the pan/tilt.

To begin, remove the two screws on the back of the pan/tilt housing and lift the cover to gain access to the pan and tilt motor assemblies.

6.1 TIGHTENING DRIVE CHAINS

Check the pan and tilt drive chains for tension. A movement of 1/32 of an inch to 3/32 of an inch in the chains is acceptable. If the movement of a chain exceeds 3/32 of an inch, adjust the chain as follows:

1. Loosen the screws securing the motor to the mounting frame.
2. Pry on the motor to apply tension to the chain. Do not over-tension the drive chain.
3. Keep tension on the chain while tightening the screws.

6.2 CHAIN DRIVE LUBRICATION

Sprockets and chains should be well greased. If necessary, lubricate the pan and tilt sprockets and chains as follows with a high-quality grease capable of withstanding temperatures from -50° to 170°F (-46° to 77°C). Do the following:

1. Liberally apply grease to the pan and tilt drive chains and sprockets (refer to Figure 5).
2. Operate the pan and tilt motors to spread the grease across the parts.
3. Apply additional grease if necessary.
4. Reinstall the cover.

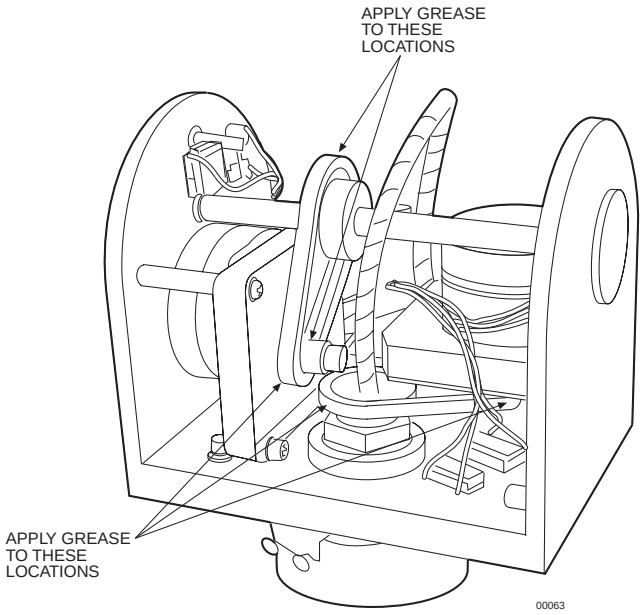


Figure 5. Servicing the Pan and Tilt

7.0 Specifications

MECHANICAL

Pan	0-355° movement in horizontal plane
Speed	12°/sec ±1° (No load condition)
Tilt	±90° movement in vertical plane
Speed	3°/sec ± .5° (No load condition)
Maximum Load	15 lb (6.8 kg) at 2 inches (5.08 cm) from tilt table surface to center of gravity
Gearing	Chain and sprocket final drive
Bearings	
Pan	Heavy-duty ball bearings
Tilt	Oilite bronze bushing
Braking	Friction type
Duty Cycle	50% duty cycle; 30-minute rating

ELECTRICAL

Input Voltage	24 VAC 50/60 Hz (PT270-24P), 120 VAC 60 Hz (PT270P), or 230 VAC 50 Hz (PT270P/230)		
Power Requirements			
(Running)	24 VAC	120 VAC	230 VAC
Pan	(7.44 VA) 0.31A	(7.2 VA) 0.06A	(8.97 VA) 0.039A
Tilt	(10.32 VA) 0.43A	(8.4 VA) 0.07A	(8.74VA) 0.038A
Connectors	Amp CPC type, mate supplied		
Motors	Two-phase induction type, instantaneous reversing		
Limit Switches			
Pan	5-amp rating (external adjustment)		
Tilt	5-amp rating (external adjustment)		
Conductor Requirements	6 or 7, unshielded (functions: left, right, up, down, motor common, safety ground)		
	No additional conductors for auto scan		

GENERAL

Construction	Aluminum plate and steel; all internal parts corrosion protected
Finish	Polyester powder coat
Environment	Indoor
Temperature	32° to 120°F (0° to 48.89°C)
Dimensions	See Figure 6
Weight	9 lb (4.08 kg)
Shipping Weight	10 lb (4.5 kg)

(Design and specifications subject to change without notice.)

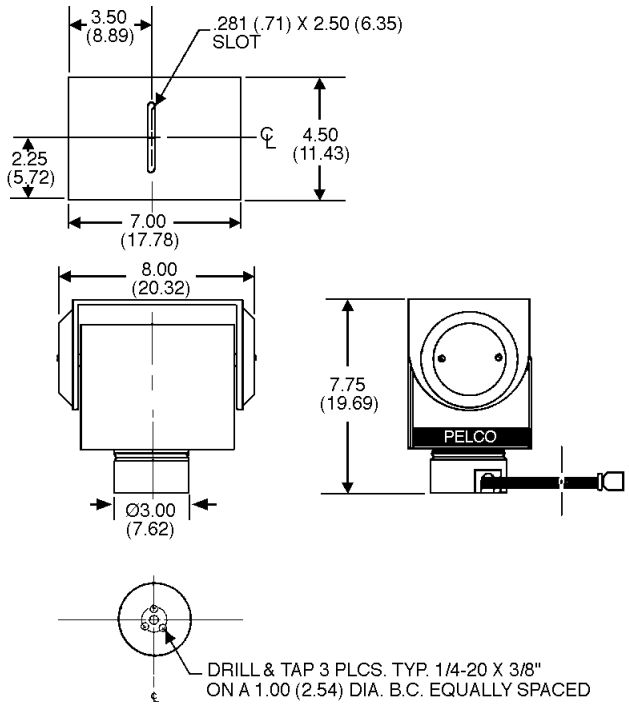


Figure 6. PT270 Series Dimension Drawing

PRODUCT WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship **for a period of one year** after the date of shipment.

Exceptions to this warranty are as noted below:

- Five years on FT/FR8000 Series fiber optic products.
- Three years on Genex® Series products (multiplexers, server, and keyboard).
- Three years on Camclosure® and fixed camera models, except the CC3701H-2, CC3701H-2X, CC3751H-2, CC3651H-2X, MC3651H-2, and MC3651H-2X camera models, which have a five-year warranty.
- Two years on standard motorized or fixed focal length lenses.
- Two years on Legacy®, CM6700/CM6800/CM9700 Series matrix, and DF5/DF8 Series fixed dome products.
- Two years on Spectra®, Esprit®, ExSite™, and PS20 scanners, including when used in continuous motion applications.
- Two years on Esprit® and WW5700 Series window wiper (excluding wiper blades).
- Eighteen months on DX Series digital video recorders, NVR300 Series network video recorders, and Endura™ Series distributed network-based video products.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico, send goods to:

Service Department
Pelco
3500 Pelco Way
Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico and are instructed to return goods to the USA, you may do one of the following:

If the goods are to be sent by a COURIER SERVICE, send the goods to:

Pelco
3500 Pelco Way
Clovis, CA 93612-5699 USA

If the goods are to be sent by a FREIGHT FORWARDER, send the goods to:

Pelco c/o Expeditors
473 Eccles Avenue
South San Francisco, CA 94080 USA
Phone: 650-737-1700
Fax: 650-737-0933

REVISION HISTORY

Manual #	Date	Comments
C323M-F	1/96	Revision F. Revised to include exploded parts assembly diagram and parts list.
C323M-G	4/97	Rev. G. Added earth-ground connection for CE compliance. Revised connector assembly instructions and maintenance section.
C323M-H	8/98	Added certifications. Revised installation instructions. Moved exploded assembly diagram and parts lists to maintenance/service manual. Changed tilt torque specification from 5 inches to 2 inches.
C323M-I	6/04	Removed section 2.2, Certifications and updated Product Warranty and Return and Information.

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